air concentrations of SO_2 . This is due to present uncertainties regarding the ability of models to reliably predict SO_2 concentrations for 5-minute periods and uncertainties with the accuracy of the input data needed to run the models. A brief summary of issues follows.

Validation. Although models are available, they have not been applied in predicting 5-minute SO₂ concentrations. Model validation studies have not been conducted to determine whether existing models can estimate with sufficient accuracy to be used in a regulatory context. Model validation studies are therefore necessary to determine the precision needed for input data for achieving the desired prediction accuracy. This would help determine, for example, whether on-site 5-minute meteorological data are needed or if nearby National Weather Service data are sufficient.

Emissions Data. In addition to the unassessed uncertainties of models, the accuracy and availability of input data, such as emissions, meteorology, and the occurrence of a short-term release (e.g., a process upset or control equipment malfunction) necessary to run the models, limits the ability to accurately predict 5-minute SO₂ concentrations at this time. Obtaining accurate source emission data for 5-minute periods is of critical importance. However, it is difficult to obtain such data since such data often depend on trying to measure emissions that may occur infrequently and at unpredictable times, concentrations, and flow rates (estimates of both flow rates and pollutant concentrations are necessary to determine mass emissions unless a mass balance can be performed, which would be difficult on a 5-minute basis). Moreover, emergency bypass valves, where measurements of emissions might be most appropriate under some circumstances, are infrequently used and therefore are not appropriate sites for the installation of monitors for continuous measurement of flow rates or pollutant concentrations.

Predicting Short-term Events. Current models used for predicting ambient air concentrations rely on a known emission release, usually some steadystate emission rate, and known past meteorological data. Short-term models use hourly weather data from the National Weather Service or from onsite meteorological stations, which are preprocessed before being used in the model. Long-term models use joint frequency distribution summaries of wind speed, direction and atmospheric stability category. In order to model for emission releases due to malfunctions, a method of determining the expected

frequency of these malfunctions would have to be employed (e.g., a Monte Carlo simulation which is a computer simulation using random sampling techniques to obtain approximate solutions to mathematical or physical problems especially in terms of a range of values each of which has a calculated probability of being the solution). To date, EPA has never attempted to integrate dispersion modeling with malfunction frequency data to set emission limits, or to perform any other regulatory modeling tasks. Indeed, EPA's longstanding position has been to regard malfunctions as violations of applicable control requirements, subject to enforcement, unless it can be shown that such malfunctions are truly unavoidable (Bennett, 1982). To allow deviations from this policy, EPA would need to develop a method along with policy and guidance for its use, which EPA does not intend to do at this time.

Meteorological Data. On-site meteorological data are preferable, but National Weather Service data may be acceptable if a station is nearby and deemed representative of the area modeled. The meteorological data requirements for 5-minute SO₂ modeling could be determined through model evaluation studies, as discussed earlier in this section.

For these reasons, in contrast with longer averaging periods, models cannot currently be used to predict 5-minute SO₂ excursions needed to support a 5minute NAAQS. However, despite these limitations, current models may still be used as a tool in a qualitative sense in the decision-making process for determining boundaries of nonattainment areas and for siting of monitors in areas of maximum concentrations. Consequently, the targeted implementation strategy which is designed to find areas exposed to high, 5-minute concentrations of SO₂ will rely principally on ambient air monitoring instead of modeling.

2. Ambient Monitoring

Requirements for monitoring are established at 40 CFR Part 58—Ambient Air Quality Surveillance. This part: (1) Contains criteria and requirements for ambient air quality monitoring and requirements for reporting ambient air quality data and information; (2) contains requirements pertaining to provisions for an air quality surveillance system in the SIP; (3) acts to establish a national ambient air quality monitoring network for the purpose of providing timely air quality data upon which to base national assessments and policy decisions; and (4) includes requirements for the daily reporting of

an index of ambient air quality to ensure that the population of major urban areas are informed daily of local air quality conditions.

In the early 1970's when EPA and the States first began to monitor for SO₂ in the ambient air, SO₂ emissions were greater and more widespread than today. Combustion of sulfur-bearing fuels occurred not only in industrial and utility settings but in private settings as well. Fuel oil and coal were burned in residences and building boilers for warmth. For this reason and because of the potential for exposures of the population, large metropolitan areas were generally selected for monitoring. Sulfur oxide emissions have decreased about 27 percent since 1970 (EPA, 1992b). Today most residences and buildings use electricity or natural gas for heating and nearby industrial or utility sources have installed control devices or have switched to lower sulfur fuel resulting in less sulfur emissions in the vicinity of the ambient air monitors. Because of these reductions in SO₂ emissions in populated areas, only a small number of monitors are now recording exceedances. Even these few exceedances are due not to area sources of SO₂ but instead to emissions from nearby industrial sources. Despite these changes in the profile of sources of SO₂ emissions, the SO₂ ambient air monitoring network has not been modified to reflect the ambient air quality for SO₂ near industrial sources.

As a result of past emphasis on urban scale air quality management, SO₂ monitoring networks are designed to measure population exposure over a large area and are not generally designed to measure the influence of specific point sources. To an increasing extent, therefore, SO₂ nonattainment areas have been identified by air quality dispersion models and defined by one or a few point sources with probability of causing a violation of the SO₂ NAAQS when operating at allowable emission limits at times of unfavorable meteorology. Increased concerns about high short-term concentrations of SO₂ occurring near point sources, together with the prevalence of low concentrations at existing networks and the inability of models to predict shortterm concentrations, suggest a need to redirect monitor networks near these sources.

As already briefly discussed, there are about 675 SO_2 SLAMS monitors across the Nation. In this notice, EPA is proposing changes to 40 CFR part 58 to allow for fewer SLAMS monitors per metropolitan statistical area. This will enable monitors and resources to be redirected towards placing monitors